INCIDENCE OF CUTANEOUS LEISHMANIASIS IN COASTAL AREAS (WINDER, UTHAL AND LASBELA) OF BALOCHISTAN PAKISTAN

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Abstract
Cutaneous leishmaniasis is a neglected protozoan disease caused by a phlebotomine sand fly that inserts a parasite into the host bloodstream by biting to expose the area of the body. These parasites cause lesion which is very painful and ulcerated. The disease is quite common like a fever in the province of Balochistan Pakistan due to the neighboring border of Afghanistan where the travelers and refugees migrate and transfer this disease into this area of Pakistan. The purpose of our study is to find out the cases and the intensity of disease in different areas of Balochistan. A study was conducted at the rural health centers in areas such as Winder, Uthal, and Lasbela in the province of Balochistan Pakistan. Where fifty patients from each area were diagnosed by sampling their lesions after taking their consent-on-consent form. From the above study, it was observed that the Cutaneous leishmaniasis was dominant in all three areas of Balochistan because its hot weather is likely to be suitable for the growth of parasite-holding sandflies. Most of the patients were male with multiple lesions and aged between 11-40 years who work in fields. No proper treatment is seriously available, desperately poor patients must face this infectious disease as their daily routine. The frequency of Cutaneous leishmaniasis is increasing to its full ultimate due to less awareness and being deprived of the proper treatment, and lack of preventive measures. To overwhelm the situation some emergency steps should be taken for this common neglected disease.

Keywords: Balochistan, Cutaneous leishmaniasis, Prevalence, Skin disease

INTRODUCTION

Leishmaniasis is a complex parasitic skin disease, which is endemic in South Asia, East Africa, Latin America, and the Middle East (1). It is found in more than eighty countries of the world. Approximately 1.5 million cases per year annually had been reported by WHO (2). Moreover, 90% of cases concluded in countries where Cutaneous leishmaniasis was known to be endemic like Afghanistan, Algeria, Brazil, Pakistan, Peru, Saudi Arabia, and Syria (3). Algeria becomes one of the most affected countries; with thousands of Cutaneous leishmaniasis cases registered every year. In the month of March and November of 2016 and 2017 sandflies were collected in Setif province Northeastern Algeria (4). In 2020 over 85% of new Cutaneous leishmaniasis cases occurred in ten countries namely Afghanistan, Algeria, Brazil, Colombia, Iraq, Libya, Pakistan, and so on (5). It is now considered a major public issue creating panic in the bordering cities like Afghanistan where the maximum influx of refugees had been traveled through Pakistan (6). Cutaneous leishmaniasis in humans had been reported in several parts of Pakistan and after malaria, it is the second...
most prevalent and vector-borne disease (7). The most promptly occurring *leishmaniasis* in Balochistan Pakistan is *cutaneous leishmaniasis*. The causative agent for this neglected skin disease is a protozoan female phlebotomine sand-fly. The hot weather, vast fields, and deep niches and cracks in the ground give the sand fly a suitable space for their growth in Balochistan Pakistan. Human infection is caused by more than twenty species which can be easily differentiated by isoenzyme analysis, molecular methods, or monoclonal antibodies. Both types that are anthropoanotic *cutaneous leishmaniasis* (urban or dry type) and zoonotic *cutaneous leishmaniasis* (rural or wet type) wider spread in the region (8). The sand fly injects infective Promastigote from their proboscis during blood meals and then phagocytized by macrophages and other mononuclear phagocytic cells. Promastigotes transform into amastigotes which multiply by simple division and proceed to infect other cells (9). The hot and dry climate of Balochistan province is very favorable for the growth and reproduction of sand flies. Protozoan female sand fly which when bite on skin cause lesion or wound in the depth of the skin. This inflammatory lesion however becomes very wet, ulcerative, and painful. Moreover, Lesion takes month and years to heal spontaneously after that they leave the scar and spot on the skin. This disfiguring disease causes serious depression in women when a lesion leaves a scar on the face or any other exposed areas of the body (10). Socioeconomically the people of the province of Balochistan Pakistan are extremely poor and most of the population is underprivileged or uneducated. Due to their poor socioeconomic status, the source of income is only their fields and farming. The outdoor work in the dry climate region of Balochistan Pakistan makes them a target for sandflies bite because these sandflies are found in ditches and burrows in open fields. The dry weather is the most favorable climate for the manifestation of these sandflies. Therefore, the present study was designed to expose the occurrence of *cutaneous leishmaniasis* in the Winder, Uthal and Lasbela areas of Balochistan Pakistan.

**MATERIALS AND METHODS**

**STUDY AREA AND SAMPLE COLLECTION**

The interventional study had been conducted in three areas i.e., Winder, Uthal and Lasbela of Balochistan province which was continued for one month on the patients who have an ulcerative lesion on their body. Ethical clearance for the study under D.O. No 5911 was taken to carry out a study on the human volunteer in those highly prevalent areas. The patients were informed a day before their diagnosis by consulting a health practitioner at the rural health center of each area. Consent forms have been taken from each patient when they reach their center before diagnosis. A total of 300 patients’ data were collected but 150 were selected for this study. The group of 50 people had been made from each *cutaneous leishmaniasis* prevalent area and the record had been made after taking their medical history and physical checkup. Each Patient has a different number, type, and size of lesions on the exposed parts of their body. The patients include children, females, and males of all age groups with the full proforma about their education, and income had been taken.

![Fig. 1. Map showing the study areas of Balochistan (Source: GIS Google Map)](http://example.com/map.png)
INCLUSION CRITERIA

All patients who had ulcerative lesions have been included in the study. With more than one lesion and willingness for diagnosis were also included in the clinical trial.

EXCLUSION CRITERIA

The patients who do not want to follow the treatment had been excluded from the study. Pregnant women and the people who were on other antibiotic therapy were also excluded from the study.

Samples of each patient were taken through a glass slide by scratching into the indurate border of red, wet, and ulcerated lesion, which was checked by the Giemsa stained smear technique under an electron microscope. If the parasite were seen the patient would be diagnosed as a cutaneous leishmaniasis patient.

DEMOGRAPHIC DATA OF THE PATIENTS

It was observed that male respondent was greater in Winder (i.e., 60%) followed by Uthal and Lasbela while female respondent was greater in Lasbela (i.e., 50%) followed by Winder and Uthal. However, the majority of the patient has been seen among the 11-40 age groups, and the lowest value was recorded for the above age of 40 years. As far the high value of literacy rate was recorded in Winder (i.e., 52%) more from Uthal and Lasbela as given in the Table I.

Table I. Information regarding demography of patients of cutaneous leishmaniasis from areas of Winder, Uthal, Lasbela, Balochistan Pakistan

<table>
<thead>
<tr>
<th>Demographic variables</th>
<th>Winder (%)</th>
<th>Frequency</th>
<th>Winder (%)</th>
<th>Frequency</th>
<th>Winder (%)</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>60</td>
<td>30</td>
<td>55</td>
<td>27.5</td>
<td>50</td>
<td>25</td>
</tr>
<tr>
<td>Female</td>
<td>40</td>
<td>20</td>
<td>45</td>
<td>22.5</td>
<td>50</td>
<td>25</td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-10</td>
<td>30</td>
<td>15</td>
<td>38</td>
<td>19</td>
<td>28</td>
<td>19</td>
</tr>
<tr>
<td>11-40</td>
<td>60</td>
<td>30</td>
<td>42</td>
<td>21</td>
<td>52</td>
<td>26</td>
</tr>
<tr>
<td>Above 40</td>
<td>10</td>
<td>5</td>
<td>20</td>
<td>10</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>Education Level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>48</td>
<td>24</td>
<td>70</td>
<td>35</td>
<td>72</td>
<td>36</td>
</tr>
<tr>
<td>Literate</td>
<td>52</td>
<td>26</td>
<td>30</td>
<td>15</td>
<td>28</td>
<td>14</td>
</tr>
</tbody>
</table>

STATISTICAL ANALYSIS

The collected data were organized into the table and analyzed using statistical analytical software Statistics 8.1 version Copyright © 1985-2005. The descriptive statistics and frequency distribution were performed.

RESULTS

Three areas Winder, Uthal, and Lasbela of Balochistan were visited, and they’re demographic as well as disease data were recorded. A total of 250 patients were taken into the study. Out of them, few patients had been excluded for their fungal and bacterial infections and some of the poor people from remote areas did not want to come to the health center for a checkup. Only 165 males and 135 females (counted as a group of fifty respondents) from three areas were detected with acute cutaneous leishmaniasis with glass slides Giemsa stained technique under an electron microscope as given in Fig. 2. Clusters in both pictures show parasites when glass slides holding a sample of lesions of patients with cutaneous leishmaniasis were kept under an electron microscope. The study specified that males were more targeted by this sand fly bite because of their outdoor working in fields where the probability of sand fly occurrence is increasing in numbers in burrows and ditches while females mostly were housewives working to finish their household chores and hardly those females who work with their males in fields or doing outdoor job got chance for hitting from this disease. The mid-age people who were between 11-40 including school-going children, children playing outside their house in-ground, working male and females had become in
higher ratio with *cutaneous leishmaniasis* disease as compared to kids and old age people who spend most of their times in homes.

The majority of patients in all three areas of the province had been physically diagnosed with multiple red, wet, ulcerated lesions and a small proportion of patients had dry nodules-like lesions. Size of the lesion may vary from 1.5 - 3.5 cm but most of the patients in all three areas showed an average lesion size was 3.0 cm as depicted in Fig. 3 (A & B). Fig. 3A is showing a status of wet, ulcerative, red lesion which is almost 2.77-3 cm in length and the dry indurated border with pus in the center of the wound. It is so excruciating and dreadful to have these types of lesions on the main body part. Fig. 3B is a scenario about pinkish dry swelled abrasion which is 3-3.5 cm in length. The primary lesions on uncovered parts of the body are forming a very painful situation if left treated.

There are probabilities of originating secondary bacterial and fungal infections from these tender, sore aches commencing multiple diseases. In remote areas of Balochistan like Uthal and Lasbela low literacy ratios were seen. People of those areas were extremely poor and uneducated they cannot afford the cost of treatment of *cutaneous leishmaniasis* and nor did they have enough money for taking preventive measures against this parasitic protozoan disease as compared to Winder, which accommodate many educated people who make their houses covered with net and used sandfly repellent which is useful to some extent.

<table>
<thead>
<tr>
<th>Table II. Status of lesions in three areas of Balochistan</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Variables</strong></td>
</tr>
<tr>
<td>Size of Lesion</td>
</tr>
<tr>
<td>Type of lesion</td>
</tr>
<tr>
<td>Wet ulcerative lesion</td>
</tr>
<tr>
<td>Dry nodular and popular lesion</td>
</tr>
<tr>
<td>Single Lesion</td>
</tr>
<tr>
<td>Double Lesion</td>
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<tr>
<td>Multiple Lesion</td>
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</tbody>
</table>
The results show that *cutaneous leishmaniasis* is a disfiguring skin disease extensively spread in three studied areas of Balochistan. Patients responded that due to a lack of proper health infrastructure and diagnostic facilities, the incidence of lesions remains untreated. Up to 4000 new cases were recorded per annum at Bolan Medical Complex, Quetta, Balochistan.

As per interpretation of the data, highest prevalence of wet ulcerative lesion were recorded in Winder (70%) followed by Lasbela (20%) and Uthal (10%). Whereas, dry lesions were recorded high in Uthal (50%) followed by Winder (30%) and Lasbela (20%) (Table II).

**DISCUSSION**

Balochistan is a more targeted province of Pakistan that is under threat of *cutaneous leishmaniasis*, a skin disease caused by a protozoan parasite, sandflies. Owing to its travelers, through neighboring borders like Afghanistan, Balochistan is at its peak of this endemic. A study in 2013-2015 among war-affected people suggested that approximately 3.61% of the area by PCR was affected in Waziristan which identified *Leishmania* tropica in 215 samples and *Leishmania* major in six samples. The successful six-month study was conducted in three areas of Balochistan. The study revealed that *cutaneous leishmaniasis* is scattered in the province like a common fever. Sandfly commonly found in all areas of Balochistan targets outdoor people by biting on exposed area and causes a deep painful wound and lesion which ranges from small cutaneous nodules to gross mucosal tissue destruction (11). Depths of lesions take several months and years to heal and cure spontaneously and after curing the wound left behind a scar that profoundly affects the quality of life of patients. The population of the province of Balochistan is extremely poor with a high index of uneducated people living in some areas where people were serious about the treatment of the disease and frequently came to Karachi skin center Hospital for the pentavalent injection. In our study, we also came to know that pentavalent injection is very costly, and it is unavailable in disease regions. Despite the severity of the disease *cutaneous leishmaniasis*, it is still considered among neglected tropical diseases worldwide and no treatment is available except pentavalent antimony. *Leishmania* species identification is important not only from an epidemiological point of view but has also relevance to clinical illness and management (12). As far as protective tools are concerned such as full nets and clothing should be implemented strictly and regularly from dawn to dusk in vastly existent areas to avoid the sandflies and to minimize the risk of infection (13). The latest randomized research in Venezuela assessed the effectiveness of pyrethroid impregnated curtains in an urban area with an incidence of *cutaneous leishmaniasis* of four percent. The use of curtains reduced the sand fly population and after twelve months of installation, the incidence of the disease dropped to zero (14). Though *leishmaniasis* is a widely spread human disease in Africa, the Middle East, Asia and South America (13). The latest randomized research in Venezuela assessed the effectiveness of pyrethroid impregnated curtains in an urban area with an incidence of cutaneous *leishmaniasis* of four percent. The use of curtains reduced the sand fly population and after twelve months of installation, the incidence of the disease dropped to zero (16). A study conducted about the prevalence of *leishmaniasis* in Karachi reported the highest rate was recorded in District West as compared to other districts (17).

**CONCLUSION**

From the research study, it was concluded that the inhabitants of Winder, Uthal and Lasbela of Balochistan were under severe threat of *cutaneous leishmaniasis*. The illiteracy and lack of knowledge in these regions make their residents more susceptible to the disease-causing factor. Although *cutaneous leishmaniasis* is more disseminated despite its inclusive incidence no serious preventive phase has been offered for this vulnerable disease for the poorest population of Balochistan, Pakistan.

**Recommendations:**

From the above research study, it is clear that the population of Pakistan still facing some neglected tropical diseases the ratio in each province. Although due to some improper treatment and attentiveness, this unresponsiveness harsh infection leads to alarming conditions. The only need is to be creating an accessible awareness for implementation of safety measures for protection from the sand flies and identification of...
parasites of cutaneous leishmaniasis areas of the country, and its negotiable treatment for the wellbeing of a healthy human environment.

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Conflict of Interest:
All authors declared no conflict of interest.

References: